IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method of estimating the characteristics of a wireless channel comprising:

receiving a plurality of training symbols sent for the purpose of facilitating channel estimation;

calculating a phase difference between at least two of the training symbols;

using the calculated phase difference to coherently combine the training symbols to produce a composite training symbol; and

using the composite training symbol to estimate the channel;

wherein the phase difference is calculated by computing the cross correlation of each of the at least two training symbols with a known training symbol and computing the self correlation of each of the cross correlations ~~between the cross-correlation values of two training symbols~~.

2. (Previously presented) The method of estimating the characteristics of a wireless channel as recited in claim 1 wherein the plurality of training symbols includes more than two training symbols.

3. (Cancelled)

4. (Previously presented) The method of estimating the characteristics of a wireless channel as recited in claim 1 wherein the calculated phase difference is used for fine frequency offset determination.

5. (Previously presented) The method of estimating the characteristics of a wireless channel as recited in claim 1 wherein the training symbols are the long symbols defined in the IEEE 802.11a standard.

6. (Previously presented) The method of estimating the characteristics of a wireless channel as recited in claim 1 wherein a plurality of phase differences are calculated and the average of the phase differences is used for fine frequency offset determination.

7. (Currently Amended) A method of classifying a packet sent over a wireless channel comprising:

receiving a plurality of training symbols sent for the purpose of facilitating channel estimation;

detecting a phase transition between at least two of the training symbols; and

classifying the packet based on the detected phase transition;

wherein the classification determines a data rate ~~for a portion of the packet, and wherein the classification determines the data rate~~ of a first field included in the packet, wherein the first field ~~that~~ contains information about the data rate ~~for another~~ of a second field in the packet.

8. (Previously presented) The method of classifying a packet sent over a wireless channel as recited in claim 7 wherein detecting the phase transition between at least two of the training symbols includes calculating a phase difference between at least two of the training symbols and comparing the calculated phase difference to a threshold.

9. (Previously presented) The method of classifying a packet sent over a wireless channel as recited in claim 7 wherein detecting the phase transition between at least two of the training symbols includes conjugate multiplying the training symbols and determining the sign of the real part of the result of the conjugate multiplying.

10. (Previously presented) The method of classifying a packet sent over a wireless channel as recited in claim 7 wherein detecting the phase transition between at least two of the training symbols includes computing the angle of the self correlation of the training symbols.

11. (Previously presented) The method of classifying a packet sent over a wireless channel as recited in claim 7 wherein the classification determines the number of training symbols expected.

12. (Cancelled)

13. (Cancelled)

14. (Previously presented) The method of classifying a packet sent over a wireless channel as recited in claim 7 wherein the phase difference is caused by inverting the sign of a selected training symbol.

15. (Previously presented) The method of classifying a packet sent over a wireless channel as recited in claim 7 wherein the phase difference is caused by inverting the sign of a selected training symbol and the classification is based on which training symbol was selected to be inverted.

16. (Previously presented) The method of classifying a packet sent over a wireless channel as recited in claim 7 wherein the result of comparing the calculated phase difference to a threshold is used as a confirmation that the packet is a valid packet.

17. (Previously presented) The method of classifying a packet sent over a wireless channel as recited in claim 7 wherein the result of comparing the calculated phase difference to a threshold is used to selectively change the polarity one or more received training symbols.

18. (Previously presented) The method of classifying a packet sent over a wireless channel as recited in claim 7 wherein the result of comparing the calculated phase difference to a threshold is used to selectively switch the polarity one or more received training symbols and wherein the calculated phase difference used to coherently combine the training symbols.

19. (Cancelled)

20. (Cancelled)

21. (Currently Amended) A system for estimating the characteristics of a wireless channel comprising:

a receiver configured to receive a plurality of training symbols sent for the purpose of facilitating channel estimation;

a processor configured to:

calculate a phase difference between at least two of the training symbols;

use the calculated phase difference to coherently combine the training symbols to produce a composite training symbol; and

use the composite training symbol to estimate the channel;

wherein the phase difference is calculated by computing the cross correlation of each of the at least two training symbols with a known training symbol and computing the self correlation of each of the cross correlations ~~between the cross-correlation values of two training symbols~~.

22. (Cancelled)

23. (Cancelled)

24. (Cancelled)

25. (Currently Amended) A computer program product for estimating the characteristics of a wireless channel, the computer program product being embodied in a computer readable medium having a stored computer program comprising computer instructions for:

receiving a plurality of training symbols sent for the purpose of facilitating channel estimation;

calculating a phase difference between at least two of the training symbols;

using the calculated phase difference to coherently combine the training symbols to produce a composite training symbol; and

using the composite training symbol to estimate the channel;

wherein the phase difference is calculated by computing the cross correlation of each of the at least two training symbols with a known training symbol and computing the self correlation of each of the cross correlations ~~between the cross-correlation values of two training symbols~~.

26. (Cancelled)

27. (Currently Amended) A method of classifying a packet sent over a wireless channel comprising:

receiving a plurality of training symbols sent for the purpose of facilitating channel estimation;

detecting a phase transition between at least two of the training symbols; and

classifying the packet based on the detected phase transition;

wherein the classification determines the data rate of a first field included in the packet, wherein the first field ~~that~~ contains information about the data rate ~~for another~~ of a second field in the packet.

28. (Previously presented) The method of classifying a packet sent over a wireless channel as recited in claim 27 wherein detecting the phase transition between at least two of the training symbols includes calculating a phase difference between at least two of the training symbols and comparing the calculated phase difference to a threshold.

29. (Previously presented) The method of classifying a packet sent over a wireless channel as recited in claim 27 wherein detecting the phase transition between at least two of the training symbols includes conjugate multiplying the training symbols and determining the sign of the real part of the result of the conjugate multiplying.

30. (Previously presented) The method of classifying a packet sent over a wireless channel as recited in claim 27 wherein detecting the phase transition between at least two of the training symbols includes computing the angle of the self correlation of the training symbols.

31. (Previously presented) The method of classifying a packet sent over a wireless channel as recited in claim 27 wherein the classification determines the number of training symbols expected.

32. (Previously presented) The method of classifying a packet sent over a wireless channel as recited in claim 27 wherein the classification determines a data rate for a portion of the packet.

33. (Previously presented) The method of classifying a packet sent over a wireless channel as recited in claim 27 wherein the phase difference is caused by inverting the sign of a selected training symbol.

34. (Previously presented) The method of classifying a packet sent over a wireless channel as recited in claim 27 wherein the phase difference is caused by inverting the sign of a selected training symbol and the classification is based on which training symbol was selected to be inverted.

35. (Previously presented) The method of classifying a packet sent over a wireless channel as recited in claim 27 wherein the result of comparing the calculated phase difference to a threshold is used as a confirmation that the packet is a valid packet.

36. (Previously presented) The method of classifying a packet sent over a wireless channel as recited in claim 27 wherein the result of comparing the calculated phase difference to a threshold is used to selectively change the polarity one or more received training symbols.

37. (Previously presented) The method of classifying a packet sent over a wireless channel as recited in claim 27 wherein the result of comparing the calculated phase difference to a threshold is used to selectively switch the polarity one or more received training symbols and wherein the calculated phase difference used to coherently combine the training symbols.

38. (Currently Amended) A system for classifying a packet sent over a wireless channel comprising:

a receiver configured to receive a plurality of training symbols sent for the purpose of facilitating channel estimation;

a processor configured to:

detect a phase transition between at least two of the training symbols; and

classify the packet based on the detected phase transition;

wherein the classification determines the data rate of a first field included in the packet, wherein the first field ~~that~~ contains information about the data rate ~~for another~~ of a second field in the packet.

39. (Currently Amended) A computer program product for classifying a packet sent over a wireless channel, the computer program product being embodied in a computer readable medium having a stored computer program comprising computer instructions for:

receiving a plurality of training symbols sent for the purpose of facilitating channel estimation;

calculating a phase difference between at least two of the training symbols;

comparing the calculated phase difference to a threshold; and

classifying the packet based on the comparison;

wherein the classification determines the data rate of a first field included in the packet, wherein the first field ~~that~~ contains information about the data rate ~~for another~~ of a second field in the packet.